3379.1.ST25.txt
SEQUENCE LISTING

<110> Kulp, David C.
       Siani-Rose, Michael A.
       Williams, Alan J.
       Harmon, Cyrus L.

<120> Nucleic Acids Encoding G Proteins Coupled Receptors

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<140> 10/038,895
<141> 2001-10-24

<150> US 60/244,082
<151> 2000-10-26

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<170> PatentIn version 3.2

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Asn Asp Ser Ser Asn Glu Lys Arg Ser Tyr Leu Leu Lys Leu Lys Val
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Met Tyr Thr Val Gly Tyr Ser Ser Ser Leu Val Met Leu Leu Val Ala
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Leu Gly Ile Leu Cys Ala Phe Arg Arg Leu His Cys Thr Arg Asn Tyr
65   70   75   80

Ile His Met His Leu Phe Val Ser Phe Ile Leu Arg Ala Leu Ser Asn
                85   90   95

Page 1

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Phe Ile Lys Asp Ala Val Leu Phe Ser Ser Asp Asp Val Thr Tyr Cys
        100                 105                 110

Asp Ala His Arg Gly Cys Lys Leu Val Met Val Leu Phe Xaa Tyr Cys
        115                 120                 125

Ile Met Ala Asn Tyr Ser Trp Leu Leu Val Glu Gly Ser Thr Phe Thr
        130                 135                 140

His Xaa Leu Ala Ile Ser Phe Phe Ser Glu Arg Lys Tyr Leu Gln Gly
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Phe Val Ala Phe Gly Trp Gly Ser Pro Ala Ile Phe Val Ala Leu Trp
                165                 170                 175

Ala Ile Ala Arg His Phe Leu Glu Asp Val Gly Cys Trp Asp Ile Asn
        180                 185                 190

Ala Asn Ala Ser Ile Trp Trp Ile Ile Arg Gly Pro Val Ile Leu Ser
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Ile Leu Asn Phe Ile Leu Phe Ile Asn Ile Leu Arg Ile Leu Met Arg
        210                 215                 220

Lys Leu Arg Thr Gln Glu Thr Arg Gly Asn Glu Val Ser His Tyr Lys
225                 230                 235                 240

Arg Leu Ala Arg Ser Thr Leu Leu Leu Ile Pro Leu Phe Gly Ile His
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Tyr Ile Val Phe Ala Phe Ser Pro Glu Asp Ala Met Glu Ile Gln Leu
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atgctcctgg tcgcccttgg catcctctgt gctttccgga ggctccactg cactcgcaac     240

tacatccaca tgcacctgtt cgtgtccttc atccttcgtg ccctgtccaa cttcatcaag     300
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gggtgctggg acatcaatgc caacgcatcc atctggtgga tcattcgtgg tcctgtgatc   240

ctctccatcc tgattaattt catccttttc ataaacattc taagaatcct gatgagaaaa   300

cttagaaccc aagaaacaag aggaaatgaa gtcagccatt ataagcgcct ggccaggtcc   360

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atgctcctgg tcgcccttgg catcctctgt gctttccgga ggctccactg cactcgcaac   240

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Glu Gly Cys Ser His Val His Ser Asn Gly Ser Tyr Thr Lys Cys Lys
            35   40   45

Cys Phe His Leu Ser Ser Phe Ala Val Leu Val Ala Leu Ala Pro Lys
        50   55   60

Asp Pro Val Leu Thr Val Ile Thr Gln Val Gly Leu Thr Ile Ser Leu
65   70   75   80

Leu Cys Leu Phe Leu Ala Ile Leu Thr Phe Leu Leu Cys Arg Pro Ile
                85   90   95

Gln Asn Thr Ser Thr Ser Leu His Leu Glu Leu Ser Leu Cys Leu Phe
            100   105   110

Leu Ala His Leu Leu Phe Leu Thr Gly Ile Asn Arg Thr Glu Pro Glu
            115   120   125

Leu Cys Ser Ile Ile Ala Gly Leu Leu His Phe Leu Tyr Leu Ala Cys
        130   135   140

Phe Thr Trp Met Leu Leu Glu Gly Leu His Leu Phe Leu Thr Val Arg
145   150   155   160

Asn Leu Lys Val Ala Asn Tyr Thr Ser Thr Gly Arg Phe Lys Lys Arg
                165   170   175

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Phe Met Tyr Pro Val Gly Tyr Gly Ile Pro Ala Val Ile Ile Ala Val
            180             185         190

Ser Ala Ile Val Gly Pro Gln Asn Tyr Gly Thr Phe Thr His Cys Trp
            195             200             205

Leu Lys Leu Asp Lys Gly Phe Ile Trp Ser Phe Met Gly Pro Val Ala
            210             215             220

Val Ile Ile Leu Asn Leu Val Phe Tyr Phe Gln Val Leu Trp Ile Leu
225             230             235             240

Arg Ser Lys Leu Ser Ser Leu Asn Lys Glu Val Ser Thr Ile Gln Asp
            245             250             255

Thr Arg Val Met Thr Phe Lys Ala Ile Ser Gln Leu Phe Ile Leu Gly
            260             265             270

Cys Ser Trp Gly Leu Gly Phe Phe Met Val Glu Glu Val Gly Lys Thr
            275             280             285

Ile Gly Ser Ile Ile Ala Tyr Ser Phe Thr Ile Ile Asn Thr Leu Gln
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Phe Cys Phe Phe Arg Gly Leu Gln Ser Asp Arg Asn Thr Ile His Lys
            35   40   45

Asn Leu Cys Ile Ser Leu Phe Val Ala Glu Leu Leu Phe Leu Ile Gly
        50   55   60

Ile Asn Arg Thr Asp Gln Pro Ala Cys Ala Val Phe Ala Ala Leu Leu
65   70   75   80

His Phe Phe Phe Leu Ala Ala Phe Thr Trp Met Phe Leu Glu Gly Val
                85   90   95

Gln Leu Tyr Ile Met Leu Val Glu Val Phe Glu Ser Glu His Ser Arg
                100   105   110

Arg Lys Tyr Phe Tyr Leu Val Gly Tyr Gly Met Pro Ala Leu Ile Val
            115   120   125

Ala Val Ser Ala Ala Val Asp Tyr Arg Ser Tyr Gly Thr Asp Lys Val
            130   135   140

Cys Trp Leu Arg Leu Asp Thr Tyr Phe Ile Trp Ser Phe Ile Gly Pro
145   150   155   160

Ala Thr Leu Ile Ile Met Asn Val Ile Phe Leu Gly Ile Ala Leu Tyr
                        Page 6

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            165                 170                 175
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Lys Met Phe His His Thr Ala Ile Leu Lys Pro Glu Ser Gly Cys Leu
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Asp Asn Ile Lys Leu Lys Ile Asn Ile Pro Ile Ile Lys Ser Ile Tyr
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Ser Glu Glu Glu Glu Arg Val Ile Ser Ser Val Ile Ser Val Ser Met
        35   40   45

Ser Ser Asn Pro Pro Thr Leu Tyr Glu Leu Glu Lys Ile Thr Phe Thr
50   55   60

Leu Ser His Arg Lys Thr Asp Arg Tyr Arg Ser Leu Cys Ala Phe Trp
65   70   75   80

Asn Tyr Ser Pro Asp Thr Met Asn Gly Ser Trp Ser Ser Glu Gly Cys
85   90   95

Glu Leu Thr Tyr Ser Asn Glu Thr His Thr Ser Cys Arg Cys Asn His
100   105   110

Leu Thr His Phe Ala Ile Leu Met Ser Ser Gly Pro Ser Ile Ile Lys
115   120   125

Asp Tyr Asn Ile Leu Thr Arg Ile Thr Gln Leu Gly Ile Ile Ile Ser
130   135   140

Leu Ile Cys Leu Ala Ile Cys Ile Phe Thr Phe Trp Phe Phe Ser Glu
145   150   155   160

Ile Gln Ser Thr Arg Thr Thr Ile His Lys Asn Leu Cys Cys Ser Leu
165   170   175

Phe Leu Ala Glu Leu Val Phe Leu Val Gly Ile Asn Thr Asn Thr Asn
180   185   190

Lys Phe Cys Ser Ile Ile Ala Gly Leu Leu His Tyr Phe Phe Leu Ala
195   200   205

Ala Phe Ala Trp Met Cys Ile Glu Gly Ile His Leu Tyr Leu Ile Val
210   215   220

Val Gly Val Ile Tyr Asn Lys Gly Phe Leu His Lys Asn Phe Tyr Ile
225   230   235   240

Phe Gly Tyr Leu Ser Pro Ala Val Val Val Gly Phe Ser Ala Ala Leu
245   250   255

Gly Tyr Arg Tyr Tyr Gly Thr Thr Lys Val Cys Trp Leu Ser Thr Glu
260   265   270

Asn Asn Phe Ile Trp Ser Phe Ile Gly Pro Ala Cys Leu Ile Ile Leu
275   280   285

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Gln Ile Tyr Glu Val Gln Gly Pro Glu Glu Glu Ser Leu Leu Arg Thr
            35   40   45

Leu Ser Phe Val Gly Cys Gly Val Ser Phe Cys Ala Leu Thr Thr Thr
        50   55   60

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Phe Leu Leu Phe Leu Val Ala Gly Val Pro Lys Ser Glu Arg Thr Thr
65              70              75              80
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Val His Lys Asn Leu Thr Phe Ser Leu Ala Ser Ala Glu Gly Phe Leu
                85              90              95
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Met Thr Ser Glu Trp Ala Lys Ala Asn Glu Ala Cys Val Ala Val Thr
            100             105             110
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Val Ala Met His Phe Leu Phe Leu Val Ala Phe Ser Trp Met Leu Val
            115             120             125
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Glu Gly Leu Leu Leu Trp Arg Lys Val Val Ala Val Ser Met His Pro
        130             135             140
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Gly Pro Gly Met Arg Leu Tyr His Ala Thr Gly Trp Gly Val Pro Val
145             150             155             160
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Gly Ile Val Ala Val Thr Leu Ala Met Leu Pro His Asp Tyr Val Ala
                165             170             175
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Pro Gly His Cys Trp Leu Asn Val His Thr Asn Ala Ile Trp Ala Phe
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Pro Leu Leu His Glu His Glu Pro Ala Gly Glu Glu Ala Leu Arg Gln
            35   40   45

Lys Arg Ala Val Ala Thr Lys Ser Pro Thr Ala Glu Glu Tyr Thr Val
        50   55   60

Asn Ile Glu Ile Ser Phe Glu Asn Ala Ser Phe Leu Asp Pro Ile Lys
65   70   75   80

Ala Tyr Leu Asn Ser Leu Ser Phe Pro Ile His Gly Asn Asn Thr Asp
                85   90   95

Gln Ile Thr Asp Ile Leu Ser Ile Asn Val Thr Thr Val Cys Arg Pro
            100   105   110

Ala Gly Asn Glu Ile Trp Cys Ser Cys Glu Thr Gly Tyr Gly Trp Pro
            115   120   125

Arg Glu Arg Cys Leu His Asn Leu Ile Cys Gln Glu Arg Asp Val Phe
    130   135   140

Leu Pro Gly His His Cys Ser Cys Leu Lys Glu Leu Pro Pro Asn Gly
145   150   155   160

Pro Phe Cys Leu Leu Gln Glu Asp Val Thr Leu Asn Met Arg Val Arg
            165   170   175

Leu Asn Val Gly Phe Gln Glu Asp Leu Met Asn Thr Ser Ser Ala Leu
            180   185   190

Tyr Arg Ser Tyr Lys Thr Asp Leu Glu Thr Ala Arg Lys Gly Tyr Gly
            195   200   205

Ile Leu Pro Gly Phe Lys Gly Val Thr Val Thr Gly Phe Lys Ser Gly
    210   215   220

Ser Val Val Val Thr Tyr Glu Val Lys Thr Thr Pro Pro Ser Leu Glu
225   230   235   240

Leu Ile His Lys Ala Asn Glu Gln Val Val Gln Ser Leu Asn Gln Thr
            245   250   255

Tyr Lys Met Asp Tyr Asn Ser Phe Gln Ala Val Thr Ile Asn Glu Ser
            260   265   270

Asn Phe Phe Val Thr Pro Glu Ile Ile Phe Glu Gly Asp Thr Val Ser
            275   280   285

Leu Val Cys Glu Lys Glu Val Leu Ser Ser Asn Val Ser Trp Arg Tyr
    290   295   300

Glu Glu Gln Gln Leu Glu Ile Gln Asn Ser Ser Arg Phe Ser Ile Tyr
305   310   315   320

Thr Ala Leu Phe Asn Asn Met Thr Ser Val Ser Lys Leu Thr Ile His
            325   330   335

Asn Ile Thr Pro Gly Asp Ala Gly Glu Tyr Val Cys Lys Leu Ile Leu
            340   345   350

Asp Ile Phe Glu Tyr Glu Cys Lys Lys Lys Ile Asp Val Met Pro Ile
            355   360   365

Gln Ile Leu Ala Asn Glu Glu Met Lys Val Met Cys Asp Asn Asn Pro
    370   375   380

Val Ser Leu Asn Cys Cys Ser Gln Gly Asn Val Asn Trp Ser Lys Val
385   390   395   400

Glu Trp Lys Gln Glu Gly Lys Ile Asn Ile Pro Gly Thr Pro Glu Thr
            405   410   415

Asp Ile Asp Ser Ser Cys Ser Arg Tyr Thr Leu Lys Ala Asp Gly Thr
            420   425   430

Gln Cys Pro Ser Gly Ser Ser Gly Thr Thr Val Ile Tyr Thr Cys Glu
    435   440   445

Phe Ile Ser Ala Tyr Gly Ala Arg Gly Ser Ala Asn Ile Lys Val Thr
    450   455   460

Phe Ile Ser Val Ala Asn Leu Thr Ile Thr Pro Asp Pro Ile Ser Val
                        Page 12

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465                    470                    475                    480


Ser Glu Gly Gln Asn Phe Ser Ile Lys Cys Ile Ser Asp Val Ser Asn
                485                 490                 495

Tyr Asp Glu Val Tyr Trp Asn Thr Ser Ala Gly Ile Lys Ile Tyr Gln
            500                 505                 510

Arg Phe Tyr Thr Thr Arg Arg Tyr Leu Asp Gly Ala Glu Ser Val Leu
        515                 520                 525

Thr Val Lys Thr Ser Thr Arg Glu Trp Asn Gly Thr Tyr His Cys Ile
    530                 535                 540

Phe Arg Tyr Lys Asn Ser Tyr Ser Ile Ala Thr Lys Asp Val Ile Val
545                 550                 555                 560

His Pro Leu Pro Leu Lys Leu Asn Ile Met Val Asp Pro Leu Glu Ala
                565                 570                 575

Thr Val Ser Cys Ser Gly Ser His His Ile Lys Cys Cys Ile Glu Glu
            580                 585                 590

Asp Gly Asp Tyr Lys Val Thr Phe His Thr Gly Ser Ser Ser Leu Pro
        595                 600                 605

Ala Ala Lys Glu Val Asn Lys Lys Gln Val Cys Tyr Lys His Asn Phe
610                 615                 620

Asn Ala Ser Ser Val Ser Trp Cys Ser Lys Thr Val Asp Val Cys Cys
625                 630                 635                 640

His Phe Thr Asn Ala Ala Asn Asn Ser Val Trp Ser Pro Ser Met Lys
                645                 650                 655

Leu Asn Leu Val Pro Gly Glu Asn Ile Thr Cys Gln Asp Pro Val Ile
            660                 665                 670

Gly Val Gly Glu Pro Gly Lys Val Ile Gln Lys Leu Cys Arg Phe Ser
        675                 680                 685

Asn Val Pro Ser Ser Pro Glu Ser Pro Ile Gly Gly Thr Ile Thr Tyr
    690                 695                 700

Lys Cys Val Gly Ser Gln Trp Glu Glu Lys Arg Asn Asp Cys Ile Ser
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3379.1.ST25.txt

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725   730   735

Ser Gln Asp Glu Met Leu Pro Thr Tyr Leu Lys Asp Leu Ser Ile Ser
740   745   750

Ile Asp Lys Ala Glu His Glu Ile Ser Ser Ser Pro Gly Ser Leu Gly
755   760   765

Ala Ile Ile Asn Ile Leu Asp Leu Leu Ser Thr Val Pro Thr Gln Val
770   775   780

Asn Ser Glu Met Met Thr Val Leu Ser Thr Val Asn Val Ile Leu Gly
785   790   795   800

Lys Pro Val Leu Asn Thr Trp Lys Val Leu Gln Gln Gln Trp Thr Asn
805   810   815

Gln Ser Ser Gln Leu Leu His Ser Val Glu Arg Phe Ser Gln Ala Leu
820   825   830

Gln Ser Gly Asp Ser Pro Pro Leu Ser Phe Ser Gln Thr Asn Val Gln
835   840   845

Met Ser Ser Met Val Ile Lys Ser Ser His Pro Glu Thr Tyr Gln Gln
850   855   860

Arg Phe Val Phe Pro Tyr Phe Asp Leu Trp Gly Asn Val Val Ile Asp
865   870   875   880

Lys Ser Tyr Leu Glu Asn Leu Gln Ser Asp Ser Ser Ile Val Thr Met
885   890   895

Ala Phe Pro Thr Leu Gln Ala Ile Leu Ala Gln Asp Ile Gln Glu Asn
900   905   910

Asn Phe Ala Glu Ser Leu Val Met Thr Thr Thr Val Ser His Asn Thr
915   920   925

Thr Met Pro Phe Arg Ile Ser Met Thr Phe Lys Asn Asn Ser Pro Ser
930   935   940

Gly Gly Glu Thr Lys Cys Val Phe Trp Asn Phe Arg Leu Ala Asn Asn
945   950   955   960

Thr Gly Gly Trp Asp Ser Ser Gly Cys Tyr Val Glu Glu Gly Asp Gly
965   970   975

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Asp Asn Val Thr Cys Ile Cys Asp His Leu Thr Ser Phe Ser Ile Leu
        980                 985                 990

Met Ser Pro Asp Ser Pro Asp Pro   Ser Ser Leu Leu Gly  Ile Leu Leu
        995                 1000                1005

Asp Ile  Ile Ser Tyr Val Gly  Val Gly Phe Ser Ile  Leu Ser Leu
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Lys Asn  Arg Thr Ser Tyr Met  Arg His Thr Cys Ile  Val Asn Ile
    1040             1045             1050

Ala Ala  Ser Leu Leu Val Ala  Asn Thr Trp Phe Ile  Val Val Ala
    1055             1060             1065

Ala Ile  Gln Asp Asn Arg Tyr  Ile Leu Cys Lys Thr  Ala Cys Val
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Ala Ala  Thr Phe Phe Ile His  Phe Phe Tyr Leu Ser  Val Phe Phe
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Trp Met  Leu Thr Leu Gly Leu  Met Leu Phe Tyr Arg  Leu Val Phe
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Ile Leu  His Glu Thr Ser Arg  Ser Thr Gln Lys Ala  Ile Ala Phe
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Cys Leu  Gly Tyr Gly Cys Pro  Leu Ala Ile Ser Val  Ile Thr Leu
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Gly Ala  Thr Gln Pro Arg Glu  Val Tyr Thr Arg Lys  Asn Val Cys
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Trp Leu  Asn Trp Glu Asp Thr  Lys Ala Leu Leu Ala  Phe Ala Ile
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Pro Ala  Leu Ile Ile Val Val  Val Asn Ile Thr Ile  Thr Ile Val
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Val Ile  Thr Lys Ile Leu Arg  Pro Ser Ile Gly Asp  Lys Pro Cys
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Lys Gln  Glu Lys Ser Ser Leu  Phe Gln Ile Ser Lys  Ser Ile Gly
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Thr Val  Phe Pro Gly Thr Asn  Leu Val Phe His Ile  Ile Phe Ala
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Ile Leu  Asn Val Phe Gln Leu  Phe Ile Leu Leu Phe  Gly Cys Leu
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Trp Asp  Leu Lys Gln Glu Ala  Leu Leu Asn Lys Phe  Ser Leu Ser
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Arg Trp  Ser Ser Gln His Ser  Lys Thr Ser Leu Gly  Ser Ser Thr
    1280             1285             1290

Pro Val  Phe Ser Met Ser Ser  Pro Ile Ser Arg Arg  Phe Asn Asn
    1295             1300             1305

Leu Phe  Gly Lys Thr Gly Thr  Tyr Asn Val Ser Thr  Pro Glu Ala
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Asn Ser Ser Tyr Ile Leu Leu His Ser Val Asn Ser Phe Ala Arg Arg
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Thr Met Gly Thr Thr Ile Ser Gly Asp Asn Ile Gly Lys Asn Phe Thr
            50                      55                      60

Phe Ser Met Arg Ile Asn Asp Thr Ser Asn Glu Val Thr Gly Arg Val
65                      70                      75                      80

Leu Ile Ser Arg Asp Glu Leu Arg Lys Val Pro Ser Pro Ser Gln Val
                85                      90                      95

Ile Ser Ile Ala Phe Pro Thr Ile Gly Ala Ile Leu Glu Ala Ser Leu
            100                     105                     110

Leu Glu Asn Val Thr Val Asn Gly Leu Val Leu Ser Ala Ile Leu Pro
            115                     120                     125

Lys Glu Leu Lys Arg Ile Ser Leu Ile Phe Glu Lys Ile Ser Lys Ser
    130                     135                     140

Glu Glu Arg Arg Thr Gln Cys Val Gly Trp His Ser Val Glu Asn Arg
145                     150                     155                     160

Trp Asp Gln Gln Ala Cys Lys Met Ile Gln Glu Asn Ser Gln Gln Ala
                165                     170                     175

Val Cys Lys Cys Arg Pro Ser Lys Leu Phe Thr Ser Phe Ser Ile Leu
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Met Ser Pro His Ile Leu Glu Ser Leu Ile Leu Thr Tyr Ile Thr Tyr
            195                     200                     205

Val Gly Leu Gly Ile Ser Ile Cys Ser Leu Ile Leu Cys Leu Ser Ile
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Glu Val Leu Val Trp Ser Gln Val Thr Lys Thr Glu Ile Thr Tyr Leu
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Arg His Val Cys Ile Val Asn Ile Ala Ala Thr Leu Leu Met Ala Asp
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Lys Gly Cys Val Ala Ala Thr Phe Phe Val His Phe Phe Tyr Leu Ser
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Val Phe Phe Trp Met Leu Ala Lys Ala Leu Leu Ile Leu Tyr Gly Ile
        290                 295             300

Met Ile Val Phe His Thr Leu Pro Lys Ser Val Leu Val Ala Ser Leu
305                 310             315             320

Phe Ser Val Gly Tyr Gly Cys Pro Leu Ala Ile Ala Ala Ile Thr Val
                325             330             335

Ala Ala Thr Glu Pro Gly Lys Gly Tyr Leu Arg Pro Glu Ile Cys Trp
        340             345             350

Leu Asn Trp Asp Met Thr Lys Ala Leu Leu Ala Phe Val Ile Pro Ala
        355             360             365

Leu Ala Ile Val Val Val Asn Leu Ile Thr Val Thr Leu Val Ile Val
        370             375             380

Lys Thr Gln Arg Ala Ala Ile Gly Asn Ser Met Phe Gln Glu Val Arg
385             390             395             400

Ala Ile Val Arg Ile Ser Lys Asn Ile Ala Ile Leu Thr Pro Leu Leu
                405             410             415

Gly Leu Thr Trp Gly Phe Gly Val Ala Thr Val Ile Asp Asp Arg Ser
                420             425             430

Leu Ala Phe His Ile Ile Phe Ser Leu Leu Asn Ala Phe Gln Phe Phe
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gacatatcag atgtcttcat tcatactatg ggcaccacca tatctggaga taacattgga     180
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Leu Leu Pro Thr Leu Asp Gln Ser Thr Val His Ile Leu Thr Arg Ile
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Ser Gln Ala Gly Cys Gly Val Ser Met Ile Phe Leu Ala Phe Thr Ile
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Ile Leu Tyr Ala Phe Leu Arg Leu Ser Arg Glu Arg Phe Lys Ser Glu
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Asp Ala Pro Lys Ile His Val Ala Leu Gly Gly Ser Leu Phe Leu Leu
                85              90              95

Asn Leu Ala Phe Leu Val Asn Val Gly Ser Gly Ser Lys Gly Ser Asp
            100             105             110

Ala Ala Cys Trp Ala Arg Gly Ala Val Phe His Tyr Phe Leu Leu Cys
        115             120             125

Ala Phe Thr Trp Met Gly Leu Glu Ala Phe His Leu Tyr Leu Leu Ala
    130             135             140

Val Arg Val Phe Asn Thr Tyr Phe Gly His Tyr Phe Leu Lys Leu Ser
145             150             155             160

Leu Val Gly Trp Gly Leu Pro Ala Leu Met Val Ile Gly Thr Gly Ser
            165             170             175

Ala Asn Ser Tyr Gly Leu Tyr Thr Ile Arg Asp Arg Glu Asn Arg Thr
            180             185             190

Ser Leu Glu Leu Cys Trp Phe Arg Glu Gly Thr Thr Met Tyr Ala Leu
    195             200             205

Tyr Ile Thr Val His Gly Tyr Phe Leu Ile Thr Phe Leu Phe Gly Met
    210             215             220

Val Val Leu Ala Leu Val Val Trp Lys Ile Phe Thr Leu Ser Arg Ala
225             230             235             240

Thr Ala Val Lys Glu Arg Gly Lys Asn Arg Lys Lys Val Leu Thr Leu
            245             250             255

Leu Gly Leu Ser Ser Leu Val Gly Val Thr Trp Gly Leu Ala Ile Phe
            260             265             270

Thr Pro Leu Gly Leu Ser Thr Val Tyr Ile Phe Ala Leu Phe Asn Ser
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Asn Lys Asn Ala Ser Ser Asp Leu Leu Gln Ser Val Asn Leu Phe Ala
                20                  25                  30


Arg Gln Leu His Ile His Asn Asn Ser Glu Asn Ile Val Asn Glu Leu
            35                  40                  45
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Phe Ile Gln Thr Lys Gly Phe His Ile Asn His Asn Thr Ser Glu Lys
50   55   60

Ser Leu Asn Phe Ser Met Ser Met Asn Asn Thr Thr Glu Asp Ile Leu
65   70   75   80

Gly Met Val Gln Ile Pro Arg Gln Glu Leu Arg Lys Leu Trp Pro Asn
                85   90   95

Ala Ser Gln Ala Ile Ser Ile Ala Phe Pro Thr Leu Gly Ala Ile Leu
            100   105   110

Arg Glu Ala His Leu Gln Asn Val Ser Leu Pro Arg Gln Val Asn Gly
            115   120   125

Leu Val Leu Ser Val Val Leu Pro Glu Arg Leu Gln Glu Ile Ile Leu
    130   135   140

Thr Phe Glu Lys Ile Asn Lys Thr Arg Asn Ala Arg Ala Gln Cys Val
145   150   155   160

Gly Trp His Ser Lys Lys Arg Arg Trp Asp Glu Lys Ala Cys Gln Met
            165   170   175

Met Leu Asp Ile Arg Asn Glu Val Lys Cys Arg Cys Asn Tyr Thr Ser
            180   185   190

Val Val Met Ser Phe Ser Ile Leu Met Ser Ser Lys Ser Met Thr Asp
    195   200   205

Lys Val Leu Asp Tyr Ile Thr Cys Ile Gly Leu Ser Val Ser Ile Leu
    210   215   220

Ser Leu Val Leu Cys Leu Ile Ile Glu Ala Thr Val Trp Ser Arg Val
225   230   235   240

Val Val Thr Glu Ile Ser Tyr Met Arg His Val Cys Ile Val Asn Ile
            245   250   255

Ala Val Ser Leu Leu Thr Ala Asn Val Trp Phe Ile Ile Gly Ser His
            260   265   270

Phe Asn Ile Lys Ala Gln Asp Tyr Asn Met Cys Val Ala Val Thr Phe
    275   280   285

Phe Ser His Phe Phe Tyr Leu Ser Leu Phe Phe Trp Met Leu Phe Lys
    290   295   300

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Ala Leu Leu Ile Ile Tyr Gly Ile Leu Val Ile Phe Arg Arg Met Met
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Lys Ser Arg Met Met Val Ile Gly Phe Ala Ile Gly Tyr Gly Cys Pro
            325             330             335

Leu Ile Ile Ala Val Thr Thr Val Ala Ile Thr Glu Pro Glu Lys Gly
            340             345             350

Tyr Ile Arg Pro Glu Ala Cys Trp Leu Asn Trp Asp Asn Thr Lys Ala
            355             360             365

Leu Xaa Ala Phe Ala Ile Pro Ala Phe Val Ile Val Ala Val Asn Leu
    370             375             380

Ile Val Val Leu Val Val Ala Val Asn Thr Gln Arg Pro Ser Ile Gly
385             390             395             400

Ser Ser Lys Ser Gln Asp Val Val Ile Ile Met Arg Ile Ser Lys Asn
            405             410             415

Val Ala Ile Leu Thr Pro Leu Leu Gly Leu Thr Trp Gly Phe Gly Ile
            420             425             430

Ala Thr Leu Ile Glu Gly Thr Ser Leu Thr Phe His Ile Ile Phe Ala
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gttgtgacgg agatatcata catgcgtcac gtgtgcatcg tgaatatagc agtgtccctt    780

ctgactgcca atgtgtggtt tatcataggc tctcacttta acattaaggc ccaggactac    840

aacatgtgtg ttgcagtgac atttttcagc cactttttct acctctctct gttttttctgg    900

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agttccaagt ctcaggatgt ggtcataatt atgaggatca gcaaaaatgt tgccatcctc   1260

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tttggaacca ttatggatca caaggta                                       1407
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